CPS/EXP/9
1.5.1967

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

APPROVED EXPERIMENTS CERN PROTON SYNCHROTRON

MAY 1967

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PS Co-ordinator

PS COUNTER EXPERIMENTS APPROVED BY NPRC

Table 1A

EXPERIMENTS ON THE FLOOR

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Conditions of Approval	Status
	Code	Description					
S33	h_3	Fast ejected protons, 12 GeV/c	Precision measurement of g-2 of muon, by measurement of spin precession of 1.3 GeV/c muons in storage ring	Bailey, Bartl, Brown, Farley, Jöstlein, van der Meer, Picasso	7.4.65	--	In Production
S55	d_{25}	Unseparated π^-, K^-, $\bar{p}$ 3 to 15 GeV/c	Angular distribution of $\pi^- p \to \Lambda^0 (\Sigma^0) K^0$ in the forward direction in energy range 4 to 16 GeV/c. Detection method: $K^0_S \to \pi^+\pi^-$, measured in spark chambers	ORSAY-PISA-SACLAY: Mannelli, Scribano, Sergiampietri, Vincelli, Caverzasio, Guillaud, Holloway	11.5.66	4 weeks for lower energies	11 GeV/c finished lower energies in production
S52	d_{25a}	Unseparated π^-, K^-, $\bar{p}$ 3 to 15 GeV/c	Measurement of decay $\eta^0, \omega^0, X^0, \varphi^0$ into $\pi^+\pi^-\gamma$ and other decay modes. Production reaction: $\pi^- p \to n + B^0$ at 6 GeV/c. Detection in magnet spark chamber, triggered by π^+, π^- and γ	CERN-ETH: Astbury, Brautti, Codling, Michelini, Websdale, Beusch, Fischer, Mühlemann, Pepin, Polgar	11.5.66	4 seeks for Test	Test started October 1966
S51	m_{4e}	Separated counter beam π, K, $\bar{p}$, below 2.5 GeV/c	Search for electromagn. decays of ρ, ω and φ mesons into e^+e^-. Determination of ω-φ mixing angle. Prod. react: $\pi p \to B^0 (\to e^+e^-) + n$ at about 2.5 GeV/c. Detectors: Time of flight for neutrons, heavy plate spark chambers for electrons	Buhler, Dalpiaz, Fortunato, Massam, Th.Muller, Navarria, Schneegans, Zetti, Zichichi	28.3.66 8.3.67	5 New PS wks.	In production
S48	m_{4b}	Separated counter beam, π, K, $\bar{p}$ ~ 2 GeV/c	Scattering of 0.9 to 2 GeV/c Kaons on a polarized target. Phase shift analysis	CERN-HOLLAND: Daum, Erné, Lagneaux, Sens, Steuer, Udo	17.11.65	--	In Production

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PS COUNTER EXPERIMENTS APPROVED BY NPRC
Table 1A (cont'd)
EXPERIMENTS ON THE FLOOR

Expt. Code	BEAM		Description of Experiment	Authors	Date of Approval by NPRC	Conditions of Approval	Status
	Code	Description					
S46	q_{3a}	Unseparated π, p < 3.5 GeV/c	Neutral decays of neutral resonances. Prod.reaction: $\pi^- p \rightarrow n + B^0$ at about 2 GeV/c. Detector: Time of flight for neutrons and heavy plate spark chambers for gammas	CERN-KARLSRUHE: Buniatov, Deinet, Muller, Schmitt, Staudenmaier, Zavattini	6.10.65	--	In Production
S60	b_{14}	Neutral K beam derived from e_3	Interference of $K_L^0 \rightarrow 2\pi^0$ and $K_S^0 \rightarrow 2\pi^0$. Detectors: Heavy plate spark chambers	J.M.Gaillard, Cholley, Jane Repellin, Schubert, Wolff	11.1.67	--	Start in May 1967
S53	p_1	Unseparated $\pi^{\pm}$, $K^{\pm}$, $p^{\pm}$ at 4-20 GeV/c, produced fr.slowly ejected proton beam e_3	Elastic π p large momentum transfer scattering up to 180^0. Detectors: wire spark chambers; magnetic analysis of both particles	Baker, Carlson, Kalbach, Krienen, Lundby, Nierhaus, Pretzl, Schopper, Woulds	11.5.66 17.8.66	--	Setting up started March 1967
S49	b_{13}	Neutral beam derived from e_3	Interference of $K_1^0 \rightarrow \pi^+ + \pi^-$ with $K_2^0 \rightarrow \pi^+ + \pi^-$ from K^0 decay. Interference experiment close to a primary target. Detectors: Spark chambers, magnetic analysis of $\pi^+ \pi^-$	CERN-AACHEN: Böhm, Darriulat, Grosso, Kaftanov, Kleinknecht, Lynch, Rubbia Ticho, Tittel	8.12.66	4 weeks	Allocated time used
S38b	e_2	Slow ejected protons	Bremsstrahlung in large angle pp scattering at about 10 GeV/c. Method: Magn. Analysis of both outgoing protons	Allaby, Bellettini, Cocconi, Diddens, Klovning, Matthiae, Sacharidis, Wetherell	23.3.66 19.4.67	$1^1/5$ New PS weeks	In Production
S56	ν	Neutrino beam	Muon number conservation. Measurement of μ^+/μ^- ratio of events produced by a pure neutrino beam and A dependence of inelastic reactions. Detectors: Spark chambers and HLBC	CERN-FRIBOURG: Borer, Hahn, Hofer, Krienen, Seiler	22.6.66 8.12.66	Parasitic on HLBC ν run	In Production

PS COUNTER EXPERIMENTS APPROVED BY NPRC

TABLE 1B

EXPERIMENTS NOT YET ON THE FLOOR

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Condition of Approval	Status
	Code	Description					
S50	m_{4b}	Separated counter beam, π, K, $\bar{p}$, ~2 GeV/c	Beta decay of Ξ hyperon. Production reaction: $K^- p \rightarrow K^+ \Xi^-$ at 1.8 GeV/c Detectors: Spark chambers	CERN-HEIDELBERG: Duclos, Freytag, Heintze, Heinzelmann, T.W. Jones, Riesenberg, Siebert, Soergel, Theriot,	23.3.66	Continuation depending on result of Test	Test finished end Oct. 1966
S54	d	π^-, 5-18 GeV/c	Measurements of the parameters A and R in π - p scattering, using a longitudinally polarized target and a spark chamber polarimeter	SACLAY: Ducros, Merlo, Movchet, Sonderegger, van Rossum	11.5.66 8.3.67	π^- only 5 New PS wks.	Start summer 1967
S59	p_2	Unseparated π^+, K^+, p^+ at 4- 20 GeV/c, produced from slowly ejected proton beam e_3	Measurement on the parameter P_o in π^+ p, K^+p, p^+p scattering, using a transversally polarized target and counter hodoscopes	CERN-PISA: Borghini, Dick, di Lella, Macq.Olivier, Cronenberger, Kuroda, Micnalowicz, Poulet, Bellettini, Bemporad, Braccini, Foa	8.12.66	--	Start September 1967
S61	e_3	Slowly extracted proton beam e_3	High energy particle production by 20 GeV protons on protons at small angles. Method: Double focusing spectrometer and DISC Cerenkov counter	Allaby, Cocconi, Diddens, Klovning, Sacharidis, Wetherell, Binon, Hugon, Görres, Meunier, Spighel, Stroot	8.2.67	--	Start October 1967
S62	d	Unseparated negative beam of 30 GeV/c	Search for charge - 1/3 e particles, produced from an internal target. Method: Counters and largegap spark chamber	Allaby, Cocconi, Diddens, Gygi, Klovning, Sacharidis, Schneider, Wetherell	8.2.67	--	Start autumn 1968

PS COUNTER EXPERIMENTS APPROVED BY NPRC

Table 1C

EXPERIMENTS FINISHED IN THE PERIOD 1 JAN. TO 1 MAY, 1967

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Date of Completion	Total Nr. of weeks*	Status
	Code	Description						
S58	d_{25}	Unseparated counter beam π^-, K^-, $\bar{p}$ 3 to 15 GeV/c	Test of large gap spark chambers in missing mass spectrometer for purpose of vertex analysis of the missing boson, produced in $\pi^- p \rightarrow p + B^-$ at $\approx$ 6 GeV/c	Chikovani, Fischer, Focacci, Kienzle, Lechanoine, Levrat, Neal, Maglić, Schübelin	16.11.66	24.1.1967	5	Analysis
S38 a	e_2	Slow ejected protons	Precise shape of angular distributions around 90° c.m. of elastic pp scattering at about 20 GeV/c	Allaby, Bellettini, Cocconi, Diddens, Matthiae, Sacharidis, Wetherell	12.1.66	10.4.1967	4 1/2	Published and Analysis

* Sum of weeks in which protons were used, for setting up, testing and data taking.

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

Table 2A

EXPOSURES SCHEDULED FOR THE NEXT MONTHS OF OPERATION

Expt. Code	Beam and Chamber	Subject	Summary	Groups	Approved Number of px/wks	Date Appr. NPRC	Start operation	Nr.appr.px. already taken 1.5.67	Total Nr. this type px already taken at CERN in same chamber
T80	m_6 Electrostatic separated beam, $2 < K < 4$ GeV/c $1 < \pi, \bar{p} < 5$ GeV/c HBC 200 H_2.	$\bar{p}$, 3.6 GeV/c	To study $Y\bar{Y}$, $Y\bar{Y}^*$ and $Y^*\bar{Y}^*$ production and annihilation into Ks and πs (for $KK\pi$, $K\pi\pi$, etc. resonances) with 10 times statistics of previous experiment	CERN, Orsay	200.000	7.5.65 12.1.66	Oct. 1966	105.000	314.000
T88		$\bar{p}$, 2.5 GeV/c	Production de $\Lambda\bar{\Lambda}$ et corrélations de polarisation. Analyse des événements avec K_1^0 pour étudier les systèmes $K\pi\pi$ (isospin 3/2 en particulier). Investigation de l'annihilation $p\bar{p} \rightarrow n\pi$.	Ecole Polytechn., Liverpool, Strasbourg	100.000	11.5.66	Summer 1967	0	122.000
T112		K^-, 2.8-4.5 GeV/c	Mécanismes de production. Extension des statistiques sur les propriétés des résonances (états finals $Y^*\pi$, Λ^0 boson neutre, nucléon K*). Production de Ξ.	Amsterdam, Ecole Polytechn. Paris, Oxford, Saclay, UCLA	400.000	11.5.66	Oct. 1966	310.000	310.000
T129		$\bar{p}$, 1.2 GeV/c	Study of the quantum numbers of the D^0 meson ($K\bar{K}\pi$) in the $K\bar{K}3\pi$ and $KK4\pi$ final states of $\bar{p}$ annihilations at 1.2 GeV/c, and accessorily all the other physical results	CERN, Collège de France, Inst. Radium, Liverpool	200.000	11.5.66	Oct. 1966	63.000	63.000
T52	idem, but D_2.	K^+, 3	Study of charge exch. in K^+n reactions. Clarification of exch. mechanisms in quasi two-body react. Verification of $S = +2$ states in reactions like $K^+K^0\Delta^0$	Brussels, CERN, Munich	100.000	8.2.67	Autumn 1967	0	0
T36	u_4 RF separated beam, $K^\pm$, > 10 GeV/c HBC 200 H_2	$\bar{p}$, 12 GeV/c	Study of 1) general characteristics of high-energy p-$\bar{p}$ interactions (inelastic, annihilation cross sections), 2) strange particle states (exchange mechanisms in $p\bar{p} \rightarrow Y\bar{Y}$, new resonances with $B = 0, \lvert S \rvert = 1$, and $\lvert B \rvert = 1, \lvert S \rvert = 1$), 3) special $S = 0$ interactions ($p\bar{p} \rightarrow N^*\bar{N}^*$, $\bar{n}p$-interactions)	Hamburg, Padua, Pisa	100.000	11.5.66	Summer 1967	0	0

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

Table 2A (cont'd)

EXPOSURES SCHEDULED FOR THE NEXT MONTHS OF OPERATION

Expt. Code	Beam and Chamber		Subject	Summary	Groups	Approved Number of px/wks	Date Appr. NPRC	Start operation	Nr. appr. px. already taken 1.5.67	Total Nr. this type px already taken at CERN in same chamber
T64	u_4	RF separated beam, $K^{\pm}$, $\geq$ 10 GeV/c HBC 200 H_2	K^-, 10 GeV/c	Production, decay and quantum numbers of resonances (especially $K\pi\pi$), reaction mechanisms at high energy, Ω^- and Ξ^- production	Aachen, Berlin, CERN, Imp.Coll., Vienna	200.000	17.11.65	May '66	132.000	132.000
T107			$^-$, 16 GeV/c	High-energy interactions, quasi two-body processes, study of resonances, comparison with 8 GeV/c π^+ results	Aachen, Berlin, Bonn, CERN, Heidelberg, Krakow, Warsaw	100.000	11.5.66	Begin 1967	56.000	56.000
T116			p, 16 GeV/c	To extend work done at 10 GeV/c on resonance production in four-body, four-constraint final states	Cambridge, Imperial College	100.000	23.3.66	May '66	57.000	57.000
T97		idem, but D_2	$^+$, 12 GeV/c	Cross sections and quantum numb. of massive resonances in I_3=0 two and three-pion system by react. $\pi^+ n \to p$ + resonance; prod. mechanisms of quasi two-body react., coherent production of pions in deuterium	Durham, Ecole Polytechnique, Milan	150.000	8.2.67	Autumn '67	0	0
T104			$^+$, 9 GeV/c	Study of the reactions: $\pi^+ d \to pp$ {mesons}^{0}; $\pi^+ d \to d$ {mesons}$^+$. Extension at higher energy of exp. done at 5.1 GeV/c	Bari, Bologna, Florence	150.000	8.2.67	Autumn '67	0	0
T102	k_7	Electrostatic separated K's 800-1200 MeV/c HBC 80	K^-, 0-400 MeV/c	Measurement of the $\Sigma^{\pm}$ and Λ leptonic decay rates (test of CVC, $\Delta S = \Delta Q$ rule, symmetry breaking in Cabibbo Theory), of the $\Sigma^0 - \Lambda^0$ form factor ratio (and test of time reversal invariance). Study of hyperon-proton scatt.	Heidelberg	10^6 in 2 years	8.12.65	May '66	855.000	1.155.000
T123			$\bar{p}$, 700 MeV/c	Study of the production of the $C^0(K\pi\pi)$, the D^0 and the E^0 mesons ($K\bar{K}\pi$) in the $K\bar{K}2\pi$ and $K\bar{K}3\pi$ final states of $\bar{p}$ annihilations at 700 MeV/c, and accessorily all the other physical results	CERN, Collège de France, Liverpool	200.000	11.5.66	Oct. '66	240.000	240.000
T126 T142			K^-, 510-750 MeV/c	Systematic study of $\bar{K}N$ interaction especially existence and properties of hyperon resonances in mass-range 1700 - 1850 MeV	CERN, Heidelberg, Saclay	250.000	11.5.66 8.3.67	Oct. '66	195.000	195.000

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

Table 2A(cont'd)

EXPOSURES SCHEDULED FOR THE NEXT MONTHS OF OPERATION

Expt. Code	Beam and Chamber		Subject	Summary	Groups	Apprvd. Nr. of px/wks.	Date appr. NPRC	Start operation	Nr. Appr. px. already taken, 1.5.67	Total Nr. this type px. already taken at CERN in same chamber
T96	74e	Fast ejected beam HLC 120 C_3H_8	$\nu + p \rightarrow N^{***} + \mu$	Study of the process $\nu + p \rightarrow N^{***} + \mu$ on free protons in propane and extension of the previous investigation with more precise data and with improved spectrum measurements	CERN	4 new PS weeks	23.3.66	March 1967	1 week	1 week
T119-T122	u_4	RF separated HBC 200 and HLBC 120 (propane + freon)	$K^{\pm}$, 10 GeV/c	Etude des interactions cohérentes sur noyau par des $K^{\pm}$ à grande énergie et des interactions $K^{\pm}$ p à grande énergie, principalement de celles produisant des π^0.	Berkeley, Ecole Polytechn., Milan, Orsay, Saclay	400.000	19.4.67	End 1967	0	0

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

TABLE 2B

EXPOSURES, FINISHED IN THE PERIOD 3.1.1967 to 1.5.1967

Expt. Code	Beam and Chamber	Subject	Summary	Groups	Apprvd.Nr. of px/wks.	Date appr. NPRC	Start operation	Nr.Appr.px. already taken,1.5.67	Total Nr.this type px.already taken at CERN in same chamber
T82	u_3 HBC 80	p, 19 GeV/c	A. General structure of the frequent topologies; in particular their content of quasi-two-body reactions. B. Reaction channels with strange particle or Baryon pair production	Copenhagen, Oslo, Stockholm	100.000	12.1.66	May '66	100.000	100.000

PHYSICS III EXPERIMENTS APPROVED BY NPRC

Table 3A

Expt. Code	Beam		Description of Experiment	Group	Approved Nr. of shifts or particles	Date of approval by NPRC	Status
	Code	Description					
E52	e_2	Ejected protons $\geq$ 10 GeV/c	Study of heavy fragments emitted in the interaction of high-energy protons with complex nuclei. Detectors: Emulsion, spectrometer	CERN, Clermont-Ferrand Valencia, Warsaw	3 shifts	17.3.1965 (12.1.1966)	Testing
E58	a_9	Low-energy secondary beam, produced from e_2 (Fast ejection)	Magnetic moment of hyperon. 250 kGauss pulsed magnet, Emulsion detectors. Prod. react.: $\pi^- p \rightarrow K^0 \Lambda$ at 1.05 GeV/c	Ankara, CERN, Lausanne, Munich, Rome	10 weeks, 1/10	25.2.1966	In Production
NSC/ 10/66	h_3	Fast ejected protons, 12 GeV/c	Nuclear reactions at high energy, studied with a mass spectrometer	Bernas, Klappisch, Chaumont, Phillipe (Orsay)	2 weeks	23.3.1966	Scheduled for May 1967
P3	internal target	20 GeV/c protons	Measurement of Li, Be and B production cross sections	Bernas, Gradsztajn, Yiou	10 hours	8.2.1967	Scheduled for Summer 1967

Table 3B

PHYSICS III EXPERIMENTS FINISHED IN THE PERIOD 1 JANUARY - 1 MAY 1967

Expt. Code	Beam		Description of Experiment	Group	Approved Nr. of shifts or particles	Date of approval by NPRC	Status
	Code	Description					
E54	u_3	RF separated beam $K^- \geq$ 10 GeV/c	Hyperfragment Studies, K^- exposures, 10 or 14 GeV/c	European K-Collaboration, Belgrade, Delhi, Hamburg, Strasbourg	$4 \cdot 10^5$ K^- in u_3 beam	17.11.1965 8.12.1966	Analysis
E56	e_2	Slow ejected protons	Fission studies in various nuclei at high energy. Mica detectors	CERN, Naples, Warsaw	3 shifts	2.12.1964	Analysis
P1	e_3	Slow ejected protons $\approx$ 15 GeV/c	Fission studies with solid state detectors (in uranium)	Heidelberg, Warsaw	2 weeks parasitically on S38	8.12.1966	Analysis

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Fig. 1 Beam and instruments
SOUTH AREA

Situation as planned for
MAY 1967

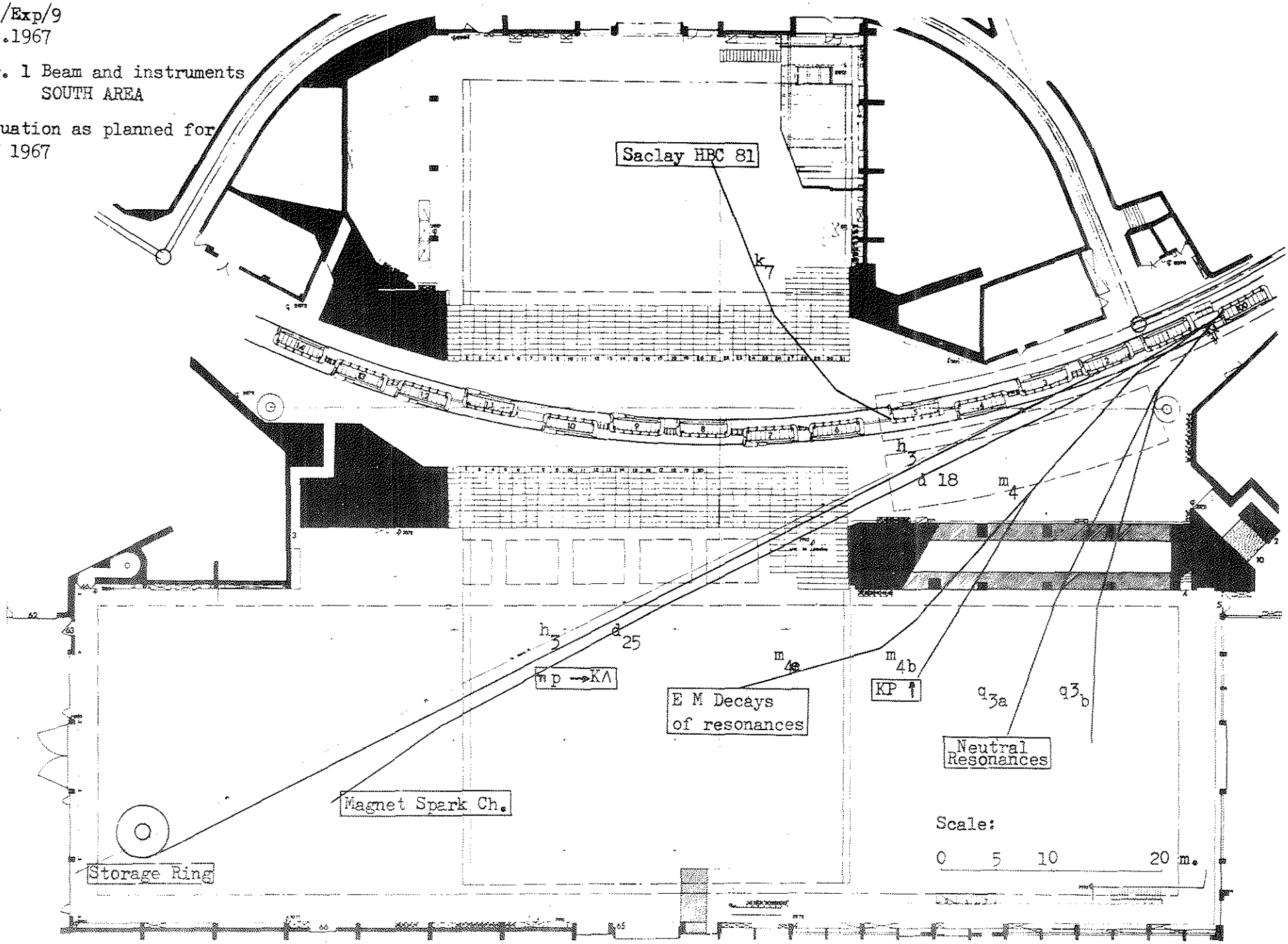

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Fig. 2 Beams and instruments EAST AREA

Situation as planned

for MAY 1967.